

Common Avionics Strategic Roadmap

Presentation

To

5th NDIA Systems Engineering Conference

Ellis F. Hitt

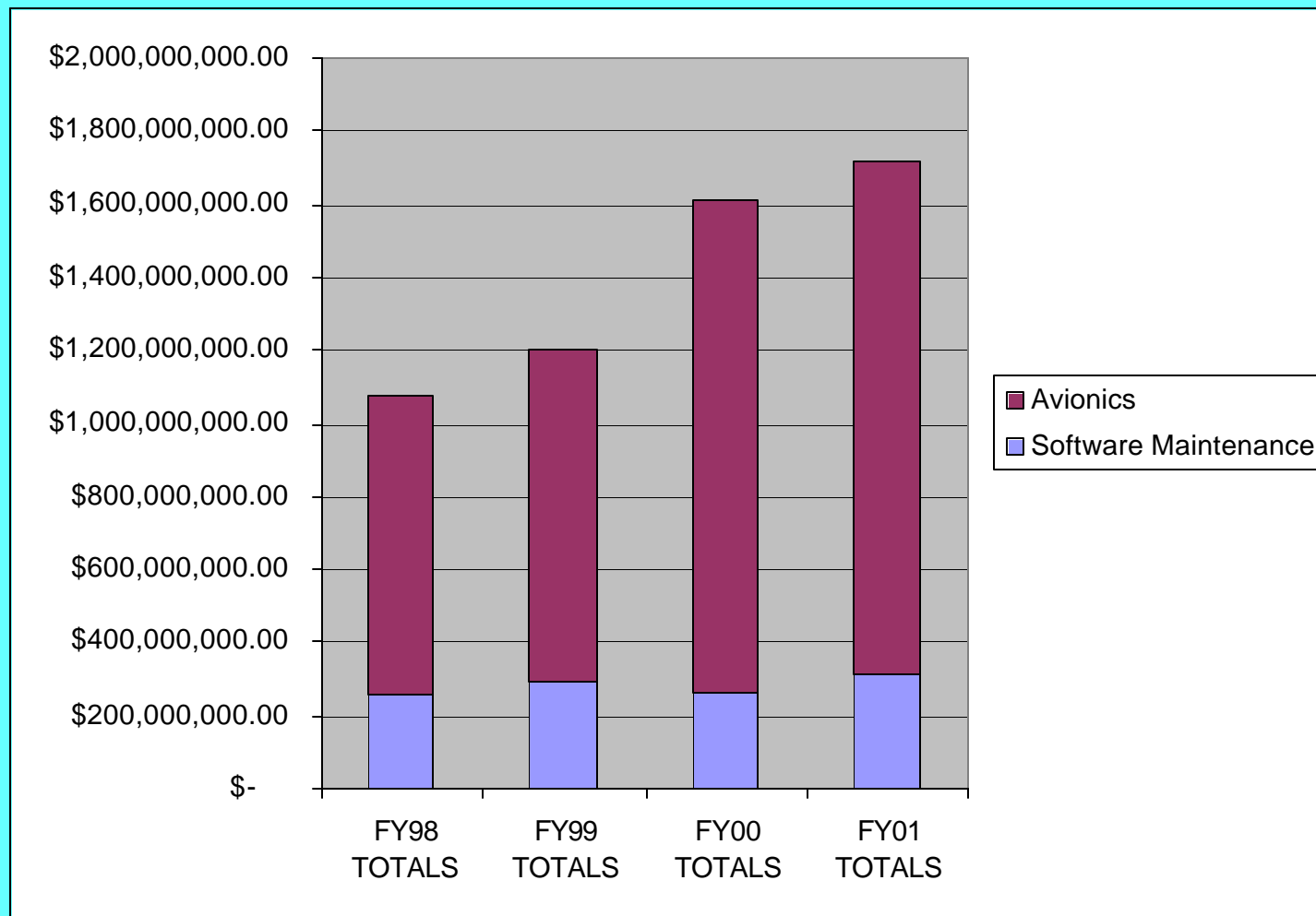
Project Manager

(614) 424-6595

Overview

- Need – Growing avionics Operations and Maintenance costs requires an integrated investment strategy
- Purpose of Common Avionics Strategic Roadmap
- Avionics Strategic Roadmap Process
- Avionics Strategic Roadmap defines desired future state by functions
- Summary

Problem – Avionics Operation and Maintenance Costs are Growing



Purpose of Avionics Strategic Roadmap

- Acquire funding to replace high Total Ownership Cost (TOC) and/or obsolete systems/subsystems, sustainment support equipment and software
- Funding requests will be fully coordinated and submitted through POM/BES process for selected replacement items to drive down cost per flying/operating hour

Define the Path

- Current State
 - Items Managed
 - Total Ownership Cost/high cost drivers/obsolete parts
 - Work performed
- Vision - Desired Future State (To Be)
 - Items Managed
 - Items to be replaced/retired and integration of functions
 - Work performed
- Activities to be performed to reach Future State
 - Requirements that replacement systems must meet
 - Investment Funding Required based on analysis of alternatives to determine Total Ownership Cost
 - Staff Development

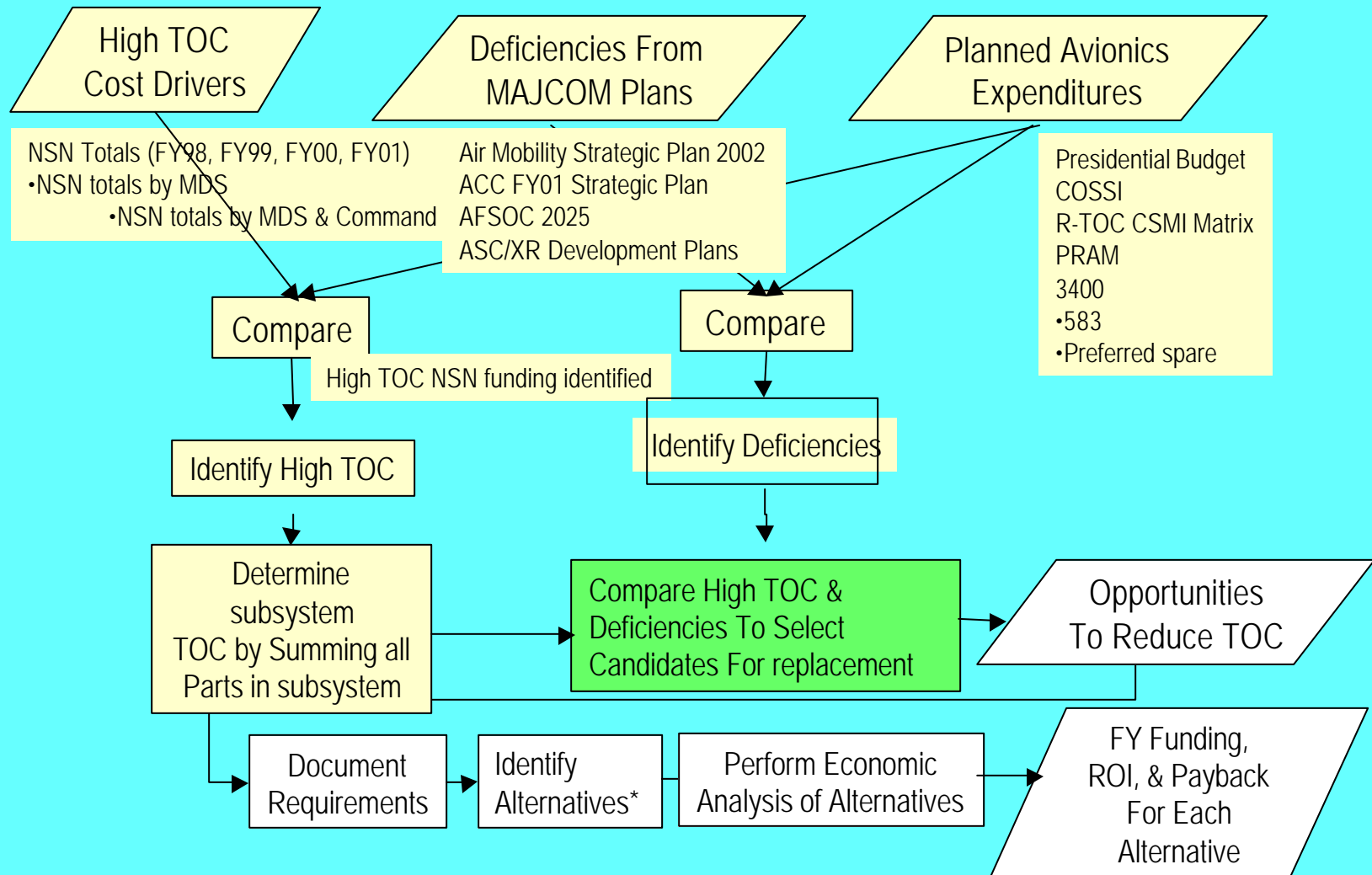
Current State of Common Avionics

- Over 400 systems/subsystems managed by WR-ALC/LY, composed of over 17,000 items
- Sustainment cost is growing
 - Parts are obsolete
 - Support equipment is becoming obsolete

WR-ALC/LY Top TOC Systems

END ITEM	FY98-MSD_Net	FY99-MSD_Net	FY00-MSD_Net	FY01-MSD_Net	Item Manager
AAQ-14 LANTIRN TGT POD	\$ 33,111,381.63	\$ 23,026,629.99	\$ 41,029,748.49	\$ 43,118,589.33	LYTSP
APN-59 WX SRCH RDR	\$ 6,856,079.21	\$ 10,081,962.58	\$ 13,611,151.65	\$ 15,366,943.46	LYGR
ARC-164 UHF	\$ 6,849,745.31	\$ 9,076,208.18	\$ 13,795,432.07	\$ 12,779,104.95	LYRC
ASQ-184 OFFENSIVE SYS	\$ 1,887,473.94	\$ 6,339,395.41	\$ 11,772,810.31	\$ 8,812,050.96	LYGF
ARN-118 TACAN	\$ 1,974,460.11	\$ 1,873,388.13	\$ 5,254,288.94	\$ 8,078,846.84	LYGN
AAQ-13 LANTIRN NAV POD	\$ 10,176,261.99	\$ 6,316,993.72	\$ 11,017,193.57	\$ 7,714,064.43	LYTSP
APN-169 Station Keeping Equipment	\$ 4,389,779.17	\$ 7,565,132.21	\$ 7,270,889.42	\$ 6,312,516.31	LYGR
ASQ-141 FLT DIR SYS	\$ 3,692,370.29	\$ 4,303,560.15	\$ 5,066,850.05	\$ 5,499,386.21	LYGF
APN-232 RADAR ALT	\$ 2,202,611.73	\$ 2,757,885.63	\$ 4,122,427.32	\$ 5,488,539.19	LYGO
APX-101(V) IFF XPNDR	\$ 1,194,994.95	\$ 1,596,458.74	\$ 3,420,364.22	\$ 5,280,289.53	LYGN
APY-1 SURVEILLANCE RDR	\$ 5,421,667.29	\$ 6,621,708.36	\$ 6,155,065.28	\$ 5,035,036.60	LYGA
APX-72 IFF XPNDR	\$ 2,630,385.55	\$ 2,934,542.50	\$ 3,140,924.00	\$ 4,622,200.00	LYGN
ARC-190 HF-SSB	\$ 3,101,997.47	\$ 5,675,112.80	\$ 5,357,265.64	\$ 3,962,787.06	LYRC
ARC-186 VHF AM-FM	\$ 1,290,801.84	\$ 2,572,009.46	\$ 2,928,847.50	\$ 2,871,838.30	LYRC
APX-64 IFF XPNDR	\$ 135,129.15	\$ 651,905.24	\$ 1,164,470.92	\$ 2,565,751.38	LYGN
ASQ-151 EO VIEWING SYST	\$ 972,194.21	\$ 1,605,594.23	\$ 3,426,684.55	\$ 2,474,410.38	LYGF
APX-76 IFF INTERROGATER	\$ 463,400.38	\$ 2,411,623.53	\$ 2,731,741.08	\$ 2,304,360.26	LYGN
APN-243 RADAR SET	\$ 295,747.47	\$ 2,226,014.49	\$ 1,078,463.04	\$ 2,290,833.27	LYGR
APN-218 DOPPLER NAV	\$ 1,208,930.11	\$ 1,877,831.66	\$ 1,296,895.48	\$ 2,279,346.86	LYGR
APX-100 IFF XPNDR	\$ 544,627.61	\$ 388,772.72	\$ 584,461.29	\$ 1,743,994.13	LYGN
APS-133 COLOR WX RDR	\$ 1,720,971.34	\$ 2,988,409.17	\$ 2,720,789.38	\$ 1,739,901.22	LYGR
URC-107(V)1 JTIDS	\$ 4,056,379.25	\$ 1,420,053.48	\$ 699,587.89	\$ 1,737,238.36	LYGA
AXQ-16 CTVS	\$ 600,052.47	\$ 758,720.50	\$ 1,019,053.07	\$ 1,557,701.85	LYGO
A-10 TELEVISION MONITOR	\$ 471,215.56	\$ 797,318.43	\$ 713,303.66	\$ 1,588,874.13	LYGO
ARN-6 RADIO COMPASS	\$ 1,037,546.27	\$ 1,221,021.85	\$ 1,734,483.61	\$ 1,305,370.65	LYGN
APQ-166 MULTIMODE RDR	\$ 1,209,283.17	\$ 1,118,279.55	\$ 1,597,788.72	\$ 1,285,659.71	LYGF
GRC-171 UHF	\$ 1,339,823.67	\$ 1,613,595.36	\$ 923,527.04	\$ 1,248,938.20	LYRG

Avionics Strategic Roadmap Process



*Candidate Technologies

*Acquisition and Installation Scenarios

Vision - Future State (To Be)

- Achieve improved mission effectiveness by upgrading to state-of-the-art technology and focusing on avionics commonality across weapon systems and ATE. Reduce cost and increase reliability.
- Process - Document Desired Future State of LY Avionics
 - What items should LY be managing in 5 and 10 years?
 - What items should be replaced with new technology items?
 - Which items to be replaced can be replaced by a modular common item?

Process

- Coordinated agreement on
 - Systems to be phased out - obsolete high TOC items managed by LY
 - Alternatives to considered as replacements
- Acquire funding to replace high Total Ownership Cost (TOC) and/or obsolete systems/subsystems, sustainment support equipment and software
 - Presidential Budget (RDT&E and Acquisition)
 - 3400/583; Acquisition
 - Working Capital Fund/Commercial Business Model

Common Avionics Strategic Roadmap

Organized by Functions

- Communication
- Navigation
- Surveillance
- Networks/Mission Processing/Displays
- Sensors
- Safety

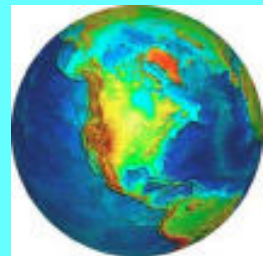
Example – Future State of Navigation

■ Future state of LY avionics – the vision

- Communications
- **Navigation**
- Surveillance
- Networks/Mission Processing/Displays
- Sensors
- Safety

ARN-6 Radio Compass
ARN-14 Omni-directional Receiver
ARN-31 Glide Path Receiver
ARN-32 Marker Beacon Receiver
ARN-58 Instrument Landing System
ARN-67 Glide Path Receiver
ARN-101 Loran/Inertial System
ARN-108 Instrument Landing System
ARN-114 Loran C/D
ARN-118 TACAN
ARN-120 Omega Navigation System
ARN-123 VOR/ILS Receiver
ARN-127 VOR/ILS System
ARN-147 VOR/ILS System
ARN-149 ADF
ASN-151 GPS
EGI

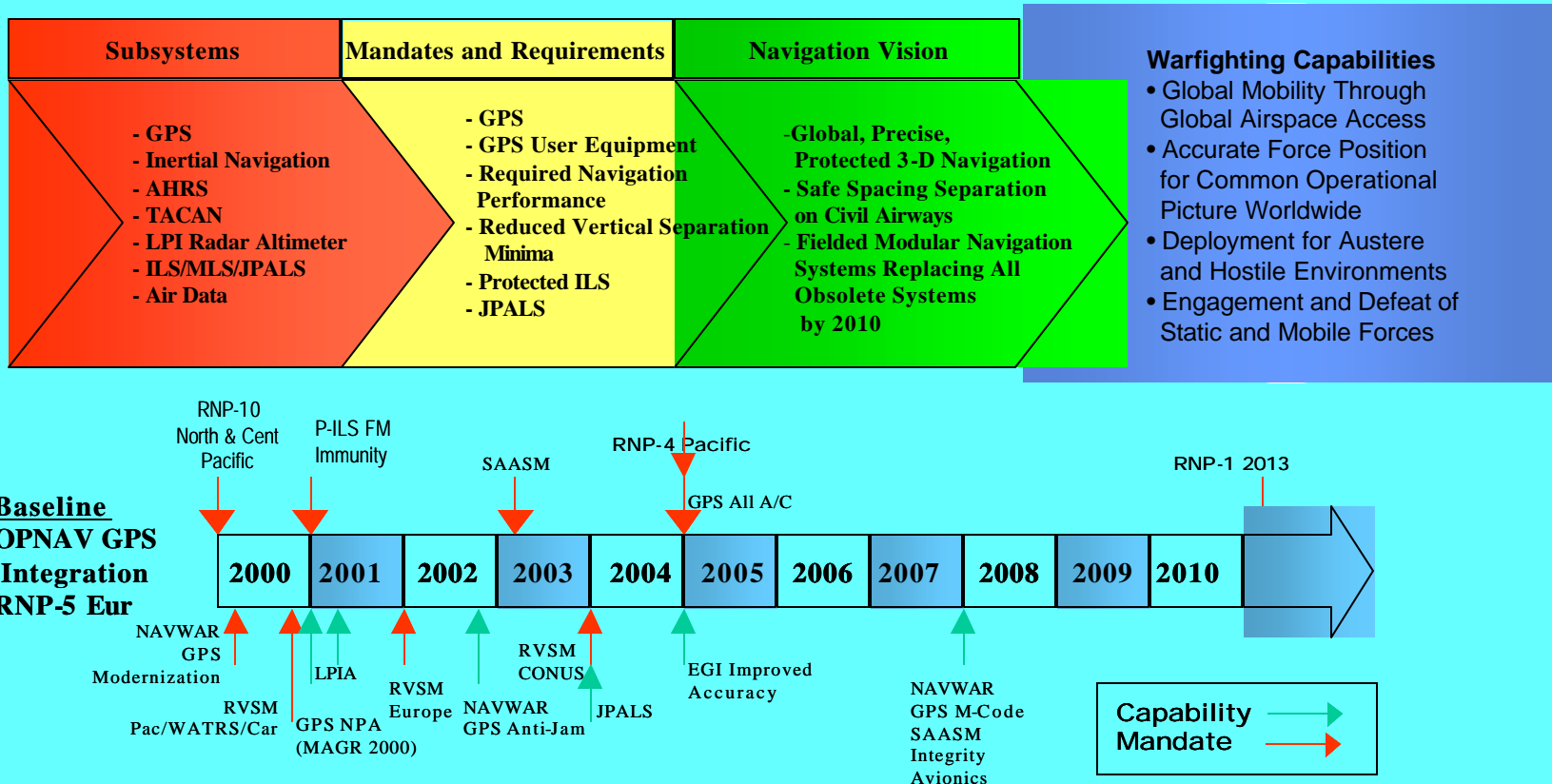
Modular Integrated Navigation
• Inertial/GPS/VOR/DME/JPALS



Example - Requirements and Mandates

■ Requirements

- Navigation



Planned Avionics Expenditures – RDT&E and Mods

MDS	PE	Project NO	MOD NO	MOD TITLE	PRIOR YEAR	1999	2000	2001	2002	2003	2004	2005	2006	2007	COST TO GO	TOTAL PROGRAM
B-52H	0101113F	4401		Air Force Mission Support System (AFMSS)		2.722	2.7									9.39
B-52H	0101113F		3143	COMMON STRATEGIC			1.8									1.8
B-52H	0101113F		3150	NAVSTAR GLOBAL POS	31.5	3.8	2.4									37.2
B-52H	0101113F	4875		Situational Awareness Defensive Improvement			7.9	11.8	28.9	22.7						134.4
B-52H	0101113F		3194	SITUATION AWARENES							31.3	42.8	21.6	27.2	35.8	158.7
B-52H	0101113F		3263	INTEGRATED CONV ST	71.2	9.6	3.3									82.7
B-52H	0101113F		3264	ELECTRO-OPTICAL VIE	4.7	5.4	2.3	2.7								9.7
B-52H	0101113F		3308	VINSON				0.8	0.5							3.9
B-52H	0101113F		4222	ARC-210 RADIO	21.3	0.8	0.1	3.2	2.4							33.2
B-52H	0101113F		4260	ADVANCED WEAPON I	10.5	0.7	1	0.9	0.3							13.4
B-52H	0101113F		4270	ECM IMPROVEMENT	1.8	4.8	5.3		0.1							11.9
B-52H	0101113F		4371	GPS TACAN	15.6	22	6.9	3.3								47.3
B-52H	0101113F	4810		Avionics Midlife Improvement (AMI)			27.9	38.5	38.0	19.2						123.528
B-52H	0101113F		4693	AVIONICS MIDLIFE IMP							14.9	15.5	1.6			32
B-52H	0101113F	4876		B-52 Global Air Traffic Management (GATM)							4.7	16.0	40.4			70.97
B-52H	0101113F		9709	GLOBAL AIR TRAFFIC									0.3	50.2	118.8	169.40
B-52H	0101113F		99999X	LOW COST MODIFICAT			0.4	0.6	0.2		0.1					2.2
			Z88888	REPROGRAMMINGS			0.1	30.7								33.6
B-52H	0101113F			TOTAL FOR AIRCRAFT B-52	156.6	47.1	57.582	92.521	70.374	41.82	51.012	74.275	63.9	77.4	154.6	975.30

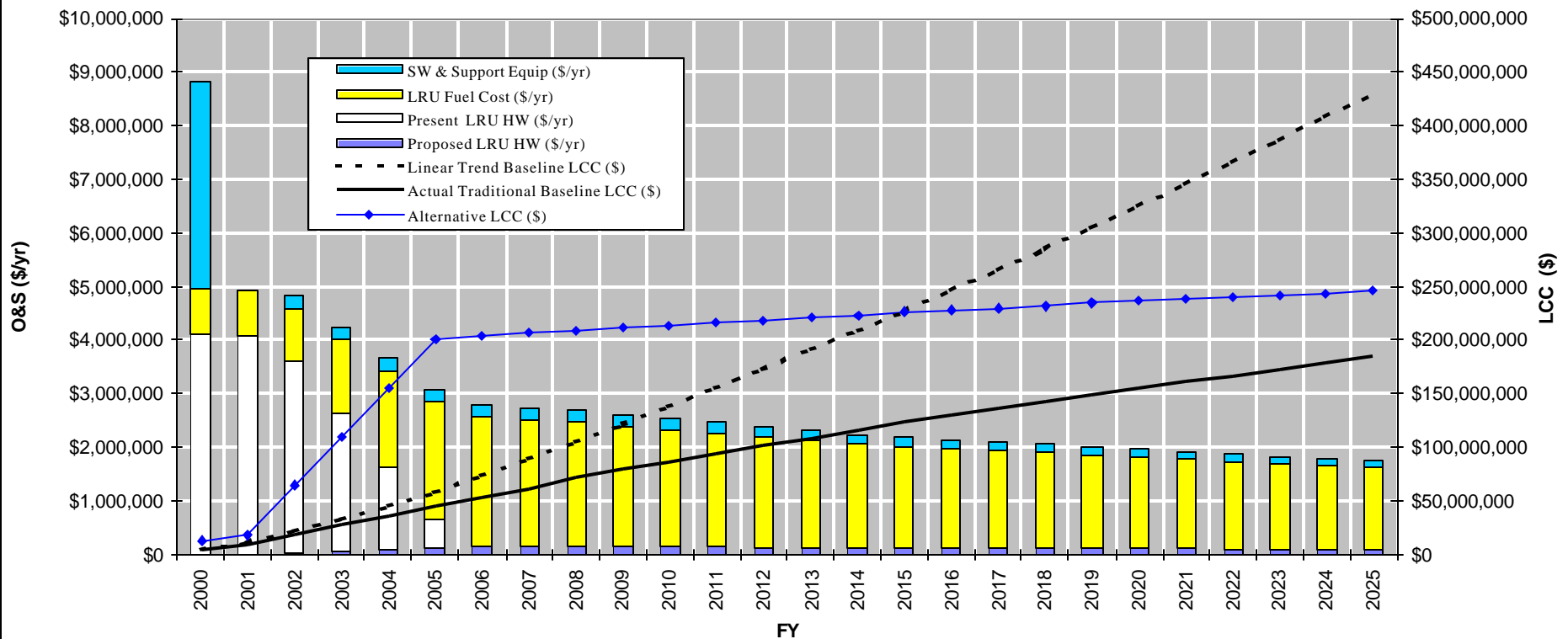
Analysis of Alternatives

- Identify affordable alternatives capable of meeting requirements by functional area
 - Communications
 - Navigation
 - Surveillance
 - Networks/Mission Processing/Displays
 - Sensors
 - Safety
- Complete Economic Analysis to determine Funding and Schedule
- Determine investment and O&M funds required for each alternative
- Coordinate type of funding requested

Trends Used to Forecast Baseline Cost to Determine ROI and Payback

- One acquisition strategy (Government Acquisition) with two forecasts

APN-232 SYSTEM REPLACEMENT



Program for Funding

- Evaluate and select best alternative
- Transform result into P-3
- Summarize P-3 by functional area and FY
 - Allocate to Weapon System's PE

	PRIOR	2001	2002	2003	2004	2005	2006	2007	2008
RDT&E (3600)			\$3,000,000	\$ 500,000					
PROCUREMENT (3010)									
INSTALL KITS									
KITS NONRECUR					\$ 25,000	\$ 50,000			
EQUIPMENT					\$ 25,165,000	\$ 20,930,000	\$ 17,080,000	\$ 22,750,000	\$ 9,939,000
EQUIPMENT NON RECURRING									
CHANGE ORDERS					\$ 25,000	\$ 50,000			
DATA				\$ 100,000					
SIM/TRAINERS									
SUPPORT EQUIPMENT									
ICS						\$ 58,900	\$ 59,800	\$ 55,700	\$ 56,900
FLIGHT TEST				\$250,000	\$250,000	\$ 100,000			
MOD OF SPARES									
OGC									
SOFTWARE			\$ 50,000	\$ 50,000					
INSTALLATION COST					\$ 28,932	\$ 29,374	\$ 27,360	\$ 27,949	
TOTAL COST (BP 1100)	\$ -	\$ -	\$ 50,000	\$ 400,000	\$ 25,493,932	\$ 21,218,274	\$ 17,167,160	\$ 22,833,649	\$ 9,995,900

Summary

- Avionics Strategic Roadmap is the LY plan for modernization of LY managed systems
 - Historical and forecast O&S costs by system with drill down to end item components
 - Coordinated, prioritized list of programs with funding required for alternatives by FY
 - Recommended modernization initiatives
- Budget document priorities are based on reduction in total ownership cost
- Budget accuracy improved through use of actual trends
- Economic analyses accurately support funding requirements based on actual data
- Roadmap database updated annually